Chapter 19

Transforming the Armed Forces: An Agenda for Change

Paul K. Davis

Since 1997, the Department of Defense (DOD) has placed a great deal of emphasis on transforming the force. This emphasis first appeared in the Quadrennial Defense Review (QDR). It was further encouraged by the National Defense Panel (NDP), which was commissioned by Congress to review the new strategy. Although the initial DOD treatment was essentially rhetorical, with no immediate influence on programs or budgets, much of the groundwork has subsequently been laid for turning that rhetoric into substance. Depending on choices made in the Bush administration, events over the next 3 to 10 years may indeed prove to be transformatory.[1]

This chapter begins with background on why transformation is needed, what some of its main features are, factors in achieving it, the current status of change within the United States, and some key issues. Some issues are for the United States alone, but it is appropriate in this volume on globalization to highlight two points. The first is that participants in future coalitions will have widely varied capabilities. The second is the importance of developing a consensus among friendly nations worldwide about how to increase the effectiveness of multinational political, economic, and military instruments for extended versions of deterrence and compellence.

Background

Why Transformation Is Needed

Military transformation is not an end in itself, but it is needed for reasons of both opportunity and necessity.[2]

Opportunity. In the relatively near term, America's forces can exploit modern technology to maintain their ability to overmatch opponents. Moreover, for most missions, it will be possible to be more militarily effective than today, even with smaller forces than would have traditionally been used for those missions. This reflects the

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traditional process of substituting technology for labor. There are limitations to what can be accomplished here, since some missions (for example, combat, even peacekeeping, in troublesome urban areas) are inherently manpower-intensive and U.S. forces are being called upon to do more missions than in years past. Nonetheless, modern technology can allow the United States to get a good deal more mileage than otherwise from whatever forces it finds necessary and affordable.

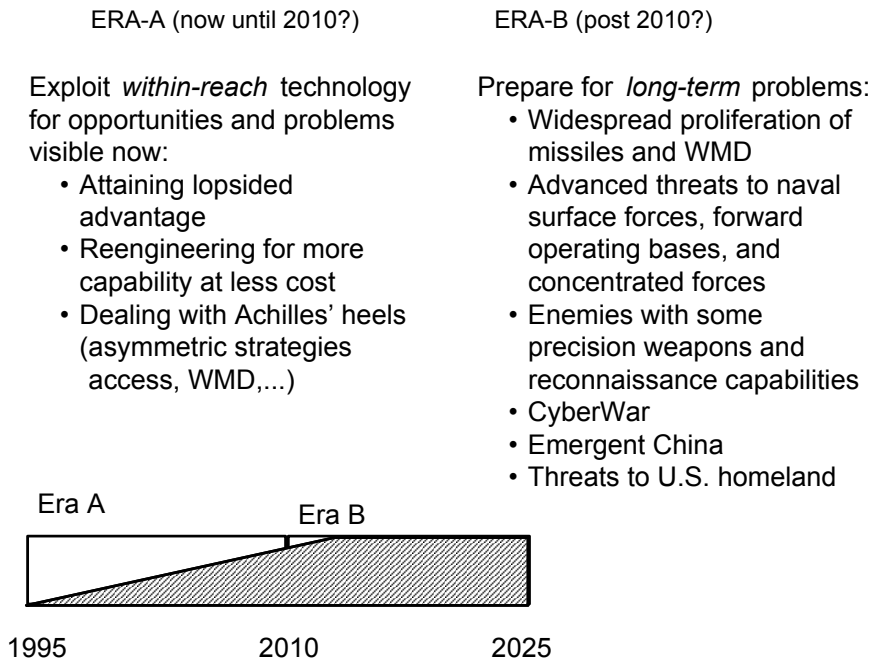
Necessity. In the longer term, many nations' forces will use aspects of the new technology. Indeed, much of the requisite technology is or will be commercially available. As a result, traditional forces will no longer be viable. For example, forces will need to disperse substantially because of the extreme vulnerability of fixed targets. For related reasons, they will need to maneuver over longer distances, to maneuver much more quickly and with much less physical concentration of forces themselves, and to operate with greatly reduced logistical footprints. In addition, they will need to defend themselves from a variety of missiles, including those carrying weapons of mass destruction (WMD). In the longer run, it is not clear how the measure-countermeasure race will play out. Aircraft and ships will become more stealthy, but remotely piloted aircraft and space-based surveillance will improve, as will missiles to attack those aircraft and ships. Active defenses will improve, but may be overcome by sheer numbers. New forms of active defenses, such as beam weapons, will perhaps be less prone to saturation. The war in cyberspace will likely be increasingly important. There is no end in sight to the changes that may occur.

Implications: Change Is Required. With this combination of near-term opportunity and daunting, longer term challenges, there should be little question about the need for major changes. Many of those changes will be inexorable consequences of the same information technology that has transformed modern business practices and day-to-day life. Others will be more uniquely related to the increased precision of weapons, superb navigation, WMD systems, and information warfare.

A Two-Era Framework for Discussing Transformation

In discussing issues of transformation, it is useful to adopt a two-era framework (see figure 1). Era A is from now until roughly 2010; Era B takes up thereafter. The distinction between the two eras is not clear-cut in time. Moreover, it does not correspond neatly to the distinction between opportunity and necessity because many of the problems that will be quite serious in Era B are already becoming matters of concern today. These include the potential for adversaries to use short-warning attacks; tactics and strategies that would delay U.S. access to regional bases; commercial satellites providing high-resolution intelligence; some highly lethal conventional weapons; cyberspace attacks; and even small numbers of mass-casualty weapons.[3] The shading in the figure suggests that these problems exist and are worrisome now but will become major features of the landscape over time.[4]

Figure 1. A Two-Era Framework for Discussing Change



Transformation and the Revolution in Military Affairs

The discussion so far has avoided deliberately any reference to the revolution in military affairs (RMA), but the linkage is often made. Sometimes this linkage is useful because it raises enthusiasms, but when it encourages hype and engenders endless debates about what constitutes a revolution in military affairs, it is counterproductive. Another problem is that too much emphasis on revolution turns the best into the enemy of the better in the budget process: any system real enough to be given a name, a program, and a budget will be seen by some as a dinosaur. Yet another problem is that RMA advocates sometimes act as though epochal changes can occur overnight, whereas revolutions often are, and need to be, the result of evolutionary processes over many years. Despite these problems, the revolution in military affairs is a useful concept and is defined as follows:

> An RMA is a major change in the nature of warfare brought about by the innovative application of technologies, which, when combined with dramatic changes in military doctrine and operational concepts, fundamentally alters the character and conduct of operations.

There have been many revolutions in military affairs over the millennia.[5] Examples are associated with the introduction of the crossbow; the emergence of navies with shot and sail; the introduction of gunpowder; Napoleon's innovations in logistics and military organization; the transition of navies to steam, steel, and submarine; carrier aviation; blitzkrieg operations; and nuclear weapons. In all of these, technol-

ogy played an important part, but the revolution required a retooling of organization and doctrine.

Everyone agrees that major technological changes are occurring. However, it remains for future historians to judge whether and when the United States and other nations harnessed that technology, combined it with the new concepts and organizations, and achieved fundamental change. One or more RMAs seem almost certain, but they may occur decades from now after a disastrous war, rather than as the result of more rational processes today. Or perhaps America will squander opportunities, while her future adversaries exploit inexpensive technology to undercut major U.S. capabilities. In any case, when the revolution occurs, we should expect it to affect only some aspects of warfare dramatically. Armored invasions over deserts may have become infeasible, but life may be similar to that in years past for infantry fighting in cities, urban sprawl, forests, and jungle.[6] Much is yet unclear.

With these cautions expressed, let us now proceed more bullishly in discussing transformation challenges and prospects. Because of the omnipresence of the information revolution in our everyday lives and economy, it is unthinkable (that is, too painful to contemplate, rather than unimaginable) that America will not achieve comparably substantial changes in military affairs. Moreover, much groundwork has been laid. If the new Secretary of Defense includes "getting on with transformation" on his short list of action items, much can be accomplished in the span of 3 to 10 years. But it will not be easy.

Moving to Transform the Force

A Strategy for Transformation

U.S. difficulties in mounting and executing a successful transformation strategy are considerable. DOD lacks such advantages (for this purpose) as an imminent threat or bankruptcy, a recent debacle, or an operational and a budgetary slack. Thus, developing its strategy, the Pentagon has focused on a great strength for change that it does possess: the professionalism of its officer corps. Members of the American military know well from their daily lives how dramatic the impact of modern information technology can be. Moreover, they consciously see themselves in learning organizations. Also, in both Operation *Desert Storm* and the Kosovo affair, they saw tangible indications of why the new ways are so needed.

DOD also benefits from having many organizations to help stimulate innovation and change.[7] As a result, there is no shortage of good ideas, initiative, and motivation for change. The obstacles to change lie elsewhere, particularly in the large, ponderous organizations and existing ways of doing business. As demonstrated by industry, however, large organizations can change.[8]

Keys to transformation strategy include providing appropriate visions, defining suitable organizational responsibilities and authorities, providing more specific objectives and requirements, providing funding for research, including experimentation, and tying transformation into the routine functioning of the department's planning,

programming, and budgeting system (PPBS) and acquisition system. This effort is still a work in progress.[9]

A Two-Era Model for Thinking about Transformation

The two-era model of figure 1 suggests a two-track approach, as seen in table 1. The reason is that the kind of planning and activity, and the management thereof, needed for Era A and Era B work are significantly different. Indeed, the efforts can even be in opposition unless carefully protected from each other.

Table 1. Differences Between Changes for Era A and Era B

Changes for Era A and the Start of Era B	*Changes for the Longer Run in Era B*
• Though surprises are likely, outcomes and outputs can be reasonably visualized. • Operational challenges can be posed and decomposed. • Responsibilities can be assigned and success assessed. • Valuable mid-term measures can set stage for longer term. • Mainstream organizations can and should make them work.	• Nature of long-run changes is such that fresh, out-of-the-box thinking is essential. • Much discovery is needed. • Outcomes are at best dimly understood. • Highly structured management is counterproductive. • Major surprises and changes of concept are likely. • Mainstream organizations are likely to actively oppose them.

Era A work lends itself to revolution by vigorous evolution driven by well-defined and relatively tightly managed programs that can be organized around discrete operational challenges that are particularly important, enduring, stressful enough to demand use of the new technology and a rethinking of doctrine and organization, and unequivocally output oriented. One example of a challenge from the Secretary of Defense might be, "Develop the capability to halt an armored invasion within days, thus rendering obsolete the classic 20th-century route to conquest"; another might be, "Develop the capability for rapid and decisive interventions in relatively small-scale conflicts, using only the small forces that could realistically be made available within the first days and weeks of need."[10]

Such missions or operational challenges are very useful. They can be understood by the organization as a whole and can be used pragmatically by managers, who can decompose the challenges into subordinate requirements for building-block capabilities and the rapidly adaptive command and control to integrate those capabilities as needed. Responsibilities, authorities, and technical requirements can be established and tests accomplished as the capabilities emerge after conceptual work, research, experiments, and iteration.

Of particular importance is the fact that Era A activities are well suited for the enthusiasms and talents of mainstream organizations and their leaders, including specifi-

cally those who seek accomplishments during their relatively short tours of duty. Thus, it should not be necessary to destroy or bypass these organizations to reform them.

A remarkable feature of the landscape highlighted in the model depicted in figure 1 is that because the beginnings of Era B problems are already visible and troublesome in their theaters, current regional military commanders can be expected to support—and even to demand—changes that might otherwise not occur for many years. That is, even regional commands or their component commands can be engines of change. In contrast, in traditional defense planning it was thought that they were so mired in the present as to be either disinterested in, or opposed to, changes in technology and doctrine.

With proper organization and top-level leadership, DOD can reasonably hope to have the military services and the joint interservice world working together vigorously on Era A developments. If this vigorous evolution-to-revolution succeeds, it will be quite a tribute to the defense establishment.

As table 1 suggests, Era B work requires a different style of work and a different style of management and financial support than does Era A work.[11] The former needs to be more exploratory with multiple paths, multiple knowledge-building experiments, and more failures than the latter. The time scale must necessarily be greater than the tours of typical military leaders or even defense secretaries. Work for Era B will require supporting and protecting special people (so-called worriers and conceivers), perhaps in skunk works devoted to exploration and advanced development. As illustrated by the way in which carrier aviation was developed, path-breaking work must go beyond studies to include experiments and prototypes with which to discover and to learn—not just demonstrate or verify.[12]

Reforming the Way Forces Are Conceived

Another challenge for DOD is to rethink the very objects on which it chooses to focus its managerial and programmatic attention. In particular, it has been evident for some time that the current tokens of defense capability (for example, numbers of classic versions of divisions, wings, and carrier battle groups; or, worse, end strength) are rapidly becoming less relevant, while smaller but highly capable units and globally netted command, control, communications, computers, intelligence, surveillance, and reconnaissance (C^4ISR) are becoming dominant factors.[13]

To be sure, the United States will also need new platforms (such as aircraft with greater range and stealth, unmanned combat aerial vehicles, relatively stealthy surface ships with small crews, lighter and faster combat vehicles). New varieties of short-takeoff-and-landing aircraft and advanced weapons are also needed. New weapons, such as those with greater standoff range and accuracy, will also be needed. Many of the most fundamental changes, however, must be organizational and doctrinal—primarily driven by information technology. It remains to be seen whether the power baronies associated with platforms and traditional units will give way to something more suitable.

Does the Modernization of Era A Create Shiny Dinosaurs?

The possibility exists that the advanced concepts and systems of Era A will come into being just about the time that we are better able to appreciate what will be needed in Era B. Some observers worry that modernizing with new platforms that are arguably just better versions of the platforms that they replace will stand in the way of more fundamental reform. To them, the F–22 is just another manned fighter aircraft—an outrageously expensive one, to boot. They have similar quarrels with advanced surface ships.

These critics have a point, but it can also be overdone. It is particularly important to note that much of Era A transformation is about information technology. Can anyone doubt that prowess in the application of information technology will be a central element of whatever eventuates in Era B? And, to take an analogy, should we forgo buying desktop computers and Palm Pilots today because, in 5 years, they will be overtaken by newer products? The question is not purely rhetorical. After all, it was only about 15 years ago that many organizations made huge investments in mainframe computers that would be rendered obsolete well within their expected lifetimes. The answer to the question is that to be effective now, we need to make the investments in what can be obtained now. At the same time, we do not want to make long-term obligations that we may later regret.

In the same spirit, Era A modernization should generate platforms, weapon systems, and command-and-control systems that are designed from the outset with the expectation of frequent and sometimes massive changes in everything resident on the platforms. Furthermore, it may be that the numbers of new, top-of-the-line platforms procured should be fewer in number than in earlier years, so as to leave room for experimental systems and iteration. The concept of a strategic pause is no longer valid, but the concept of reverting to old-style massive buys with the expectation of 20-year lifetimes, with only minor changes, could be disastrous.

Recent Developments

U.S. Joint Forces Command

The jury is still out on transformation, but as indicated above a good deal of groundwork has been laid in the last few years. Most important, U.S. Joint Forces Command (JFCOM), which replaced U.S. Atlantic Command, is oriented heavily toward transformation.

JFCOM has the roles of joint trainer, integrator, and provider. Perhaps most relevant, it has been given prime responsibility for joint experimentation, an unfortunate rubric used for many transformation-related activities.[14] Many important details are still evolving, and many issues remain, such as how much funding JFCOM should have and for what purposes. Even with today's responsibilities and authorities, however, JFCOM has a great deal of opportunity to move the transformation effort forward. Success depends, of course, on the strong support of the Secretary of Defense and the Chairman, but Commander in Chief, U.S. Joint Forces Command, indeed has

that support.[15] Moreover, JFCOM now plays a more explicit role in the critical requirements-setting process. In addition, the Joint C[4]ISR Battle Center does rigorous testing of interoperability for selected systems.

JFCOM work on joint experimentation is beginning to gain momentum after a fairly lengthy period of startup during which it was ill-staffed for its new mission and deluged with miscellaneous expressions of miscellaneous needs. It has now focused its work considerably and organized accordingly. As of summer 2000, its focus areas were:

- Command and Control
- Combat Identification
- Intelligence Surveillance and Reconnaissance
- Attack Operations Against Critical Mobile Targets
- Joint Deployment Process
- Joint Simulation System
- Unmanned Aerial Systems (for Battlefield Awareness)
- Deep Theater Air and Missile Defense
- Strike and Battlefield Interdiction

A significant feature of these focus areas is that they are all quintessentially joint and unquestionably important. Moreover, they relate to relatively high-level military functions. This is not accidental since JFCOM has been careful to focus its energies on these matters, rather than to redundantly attack problems that are already being pursued by the individual services or define tasks at too low a level. There are many reasons to believe that the greatest leverage in increased jointness, as well as exploitation of modern technology, is in the higher level functions of particular concern to CINCs, Joint Task Force commanders, and their subordinate commanders.

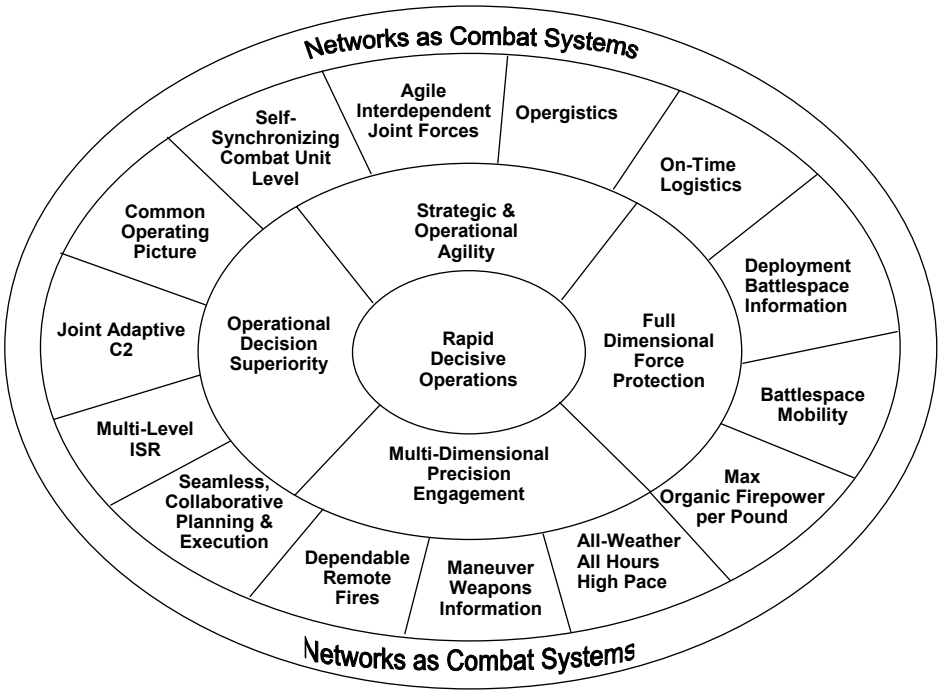
In related developments, joint experimentation work by JFCOM is now organized around what amount to two large integrating concepts: Rapid Decisive Operations (RDO) and Attack Operations Against Critical Mobile Targets. Closely associated with these are such subordinate subjects as joint interactive planning; assurance that commanders have a common relevant operational picture; adaptive joint command and control; information operations; focused logistics; forcible entry operations; and strategic deployment.

Figure 2 is a useful depiction of how one can look at the RDO issue, variants of which have been urged for several years.[16] In this depiction, the RDO concept depends on four key subordinate attributes of the force: strategic and operational agility, full-dimensional force protection, multidimensional precision, and operational decision superiority. These correspond, with some name changes, to themes of the influential *Joint Vision 2010*.[17] Moving outward in the figure, one sees a ring of enablers, such as agile interdependent joint forces (top center).

The RDO concept is being explored in the JFCOM Millennium Challenge '00 activity. The study of this concept involves everything from brainstorming to human war gaming, more extensive computer simulation, and field experiments. A similarly broad range of work is needed for the critical mobile target problem. A significant

start on the simulation work was accomplished by JFCOM in 1999, with major help from the Institute for Defense Analyses (IDA). Stimulated in part by earlier work of the Defense Science Board,[18] the research involves state-of-the-art, man-in-the-loop synthetic theater of war tools, which evolved from SIMNET work pioneered earlier under the Defense Advanced Research Projects Agency. In the 1999 work, IDA examined the significance of alternative command and control relationships, as well as new sensors and weapons for attacking mobile targets. Some conclusions were highly significant and, equally important, convincing to participating services.

Figure 2: Rapid Decisive Operations: Its Primary Components and Enablers



Source: Adapted from a briefing by General Lawrence G. Welch, USAF (Ret.)

In summary, JFCOM has been stood up, funded, and anointed to lead the transformation effort. It is now well under way, and one may hope to see significant accomplishments over the next few years.

The Crucial Role of the Services

Although transformation is often seen as a joint matter, and thereby tied to US JFCOM, it is important to emphasize that the vast majority of changes in a successful transformation will in fact be accomplished within the separate services. The American military system is built around the services, and it is in the services that one finds

not only long traditions but also great depth of expertise in matters ranging from research and development on systems to both current doctrine and potential innovations. Moreover, the services have been remarkably vigorous in recent years. Navy emphasis on network-centric operations, Air Force moves toward becoming an Expeditionary Air Force, Marine Corps continuing experiments with new doctrinal concepts (for example, Desert Warrior, Urban Warrior), and, most recently, announced Army effort to develop medium brigades with increased responsiveness and flexibility are all important activities that will be at the core of transformation—if these efforts bear fruit as intended. Although there is always a basis for skepticism, and indeed many initiatives over the years (for example, the Navy Arsenal Ship and the Army Strike Force) have petered out, guarded optimism appears to be more appropriate. Not only are there many talented, vigorous, and forward-looking people at work in the services, but also the great accomplishments in private industry—driven by transformational strategies—are a constant motivator and a constant basis for them to argue in favor of the changes that they advocate.[19]

Shortfalls

Despite this progress by both the services and the joint system, the status of transformation remains spotty. Some of the signs of this are severely underfunded modernization; continued Achilles' heel problems in even near-term major theater wars (for example, base access problems, short warning, WMD); slow and uneven changes of doctrine; a programming and budgeting system still geared toward marginal decisions about classic measures of capability, rather than strategic decisions focused on the character of future warfare; and continued preoccupation of the services with budget share and end-strength.

Another problem is that the quantity of joint training and exercising is not as large as it probably should be to refine the skills needed, much less to learn from iteration. The reason is that service training and exercising already place great demands on the forces—demands that are exacerbated by the many calls for them to be employed in real contingencies. There is no simple remedy for the shortage of joint activities, but more joint command post exercises—which are less demanding of personnel, travel, and time—can accomplish a good deal. Also, joint overlays on what are essentially service exercises are often proving useful. In any case, there is much still left to be done on transformation. The process has only begun.

Next Steps for the United States

The Bush administration will have a historic opportunity. No one can predict confidently what that administration will in fact do, but it is surely plausible that the newly appointed Secretary of Defense will, early in 2001, construct a short list of action items for special attention during his tenure. It is also quite plausible that getting on with transformation will be on that list. If so, and if the many stars in the heavens are properly aligned, then much can happen within 3 to 10 years. Some priorities should include:

- Redefining the building-block forces that determine U.S. and coalition military capabilities (for example, moving from a division-centric Army structure to a more brigade-centric structure with brigades that are substantially smaller but more capable—for most missions—than are current brigades).
- Adopting a mission-system view in conceiving, evaluating, and implementing programs, which will require significant changes in how the PPBS is conducted.[20]
- Fielding initial versions of these building-block forces and beginning the lengthy process of perfecting them and transitioning force structure, personnel systems, and doctrine.
- Implementing network-centric operations, with its implications for command and control and the acquisition processes in defense planning.[21]
- Fielding modest but significant missile defenses.

These may need to occur during the same decade in which U.S. global military posture adjusts to changes in the strategic environment. This chapter is not the place to discuss such adjustments in detail, but the warming relationship between North and South Korea reminds us that the presence of U.S. ground forces in the middle of Korea is hardly a natural and permanent matter. Nor, for that matter, is the presence of U.S. ground forces natural in the middle of Europe, or even in the chronically troubled Persian Gulf. Such presence may prove desirable to those affected and therefore persist for a very long time, but this is by no means a foregone conclusion. It is arguably more likely that the global U.S. force posture will come to depend increasingly on naval forces, air forces, and small but rapidly projected and highly capable ground forces—coupled with both permanent and ad hoc networks of systems for intelligence, reconnaissance, and surveillance, and with networks of systems for theater missile defense.

Allies Are a Core Requirement, Not a Necessary Annoyance

It has been observed that American military planners would often prefer that allies just stay out of the way, especially in combat operations. Operational planning is difficult under the best of circumstances, but more dramatically so when encumbered by major disparities in capability, interoperability, and detailed targeting and rules of engagement. So, also, transformation is difficult enough for the United States without worrying about allies.

Despite all this, even the most rudimentary analysis of future scenarios and missions demonstrates that allies will be at the core of many and probably most operations. U.S. forces will be neither defending empty territory nor attempting to deter adversaries from threatening empty territory. On the contrary, operations will be conducted in support of others and involve numerous countries.

If we move to more specific matters, allied issues also loom large. The reasons include the following:

- As discussed below, deterrence or timely action in defense of friendly countries will typically depend on having appropriate U.S. military capabilities in place before crises occur. This, in turn, will be possible only with long-term relationships and presence agreements.[22]
- Employment of U.S. ground forces and ground-based air forces will continue to depend critically on working relationships with host countries.
- Interventions (or threatened interventions) on the ground will prove necessary because there are too many circumstances in which air forces and missiles simply cannot accomplish the key missions (for example, stopping the killing in places such as Kosovo during the Serbian period of ethnic cleansing). Although U.S. ground forces will be involved, their numbers may be modest in percentage terms. This will be especially so for manpower-intensive operations in urban areas, forests, or jungles.
- Theater missile defense systems will depend for their effectiveness on layering and networking. Although some components will be naval, others will need to be located in friendly countries. Overall defense systems will need to be integrated during operations to achieve high effectiveness and to avoid fratricide.
- U.S. forces are probably not suitable for many key operations on the ground. The reasons include perceived legitimacy, language gaps, cultural naïveté, and inhibitions in periods when ruthlessness is required. U.S. forces may make for good SWAT teams and may be ideal for rapid and decisive operations, but they will not be suitable for others.

A contrasting military-technical view is that threats from WMD, delivered by missiles of increasing range, will drive U.S. forces to greater range and, eventually, to disengagement and a fall back to the United States itself. The preferred systems in the future, according to this view, will be long-range bombers, submarines with long-range missiles, and dispersed surface ships well distant from shore. This image is misleading to the extent that it encourages a pullback of U.S. forces and a lessening of military engagement. Ultimately, the strength of the international security system depends on continued close engagement. Moreover, as noted above, the ability of the United States to react decisively in crisis, and the ability of defended allies to risk requesting such assistance, may depend on U.S. forces already being in those territories. It is one thing to imagine a President and the ally's leader agreeing to a decisive reinforcement; it is quite another to imagine a fresh intervention when, from the viewpoint of cautious Americans, the United States has no vital national interests at stake and the risks are high—as they might be if the aggressor threatened to start using missiles and weapons of mass destruction if U.S. forces began to deploy. The aggressor might make similar threats to prevent reinforcement of forces already in place, but the decision dynamics would be quite different because the U.S. imperative would be to reinforce its troops.

Must Allies Also Transform Their Forces?

Peacemaking, Peacekeeping, and Interoperability

On the one hand, it can be argued that most nations do not need military forces with high-tech firepower and maneuverability. They primarily need forces suitable for peacekeeping and some moderately stressful peacemaking.[23] For them, the best transformation might look more like drastic reductions in the size of forces, plus increased capabilities for projecting and supporting peacekeeping/peacemaking forces, rather than a high-tech revolution. Key elements might be mundane trucks rather than top-of-the-line weapons. More generally, there is a requirement for power projection logistics, which is needed for combat operations as well as peacekeeping and peacemaking. The logistics shortfall includes strategic mobility.

The conundrum is that if coalition operations are to succeed, then it would seem necessary that U.S. and allied forces be reasonably compatible. That line of reasoning suggests the need for allies to modernize their forces. Otherwise, as in the conflict with Serbia over Kosovo, only U.S. air forces will be militarily effective. In a war involving ground forces, similar disparities would arise. U.S. forces would aspire to sudden and decisive dismantling of enemy units, whereas allied units might be condemned to classic close combat and extended dirty operations.

Preparing for Strategic Adaptations

A third consideration is that many nations must be concerned about maintaining a high level of military expertise so that, in the event of drastic changes in the strategic environment, they will be able to field competent and sizable forces for large-scale war. And, of course, professional military officers are often more interested in maintaining such expertise than in specializing only in peacekeeping operations.

Priorities for the High-End Component of Allied Force Adaptations

What are the consequences of these considerations? There is no single, one-liner strategy: each nation will need to have a relatively complex strategy dealing to some degree with all of the above considerations. From the perspective of the United States and future coalition operations, however, the high-end component of allied efforts should set a high priority on the following:

- Higher level joint and combined command and control (for example, excellence of common situation assessment, common understanding of all major unit missions and rules of engagement).
- True network-centric capabilities for joint/combined air and missile defense.

The first of these stems from the observation that the primary tool of coalition planners for avoiding problems has been, and will continue to be, separation of areas of responsibility. Individuals at the platoon level of one nation simply do not need to know what their analogues from other nations are doing. Moreover, if units deployed

by nation X are much more effective than those of nation Y and that fact is known to commanders, then so be it. The coalition can cope in any case. The same is not true at the operational level. Commanders at this level need to have common operational pictures and the ability to avoid fratricide due to inadvertent maneuvers. Unfortunately, today there are severe operational-level problems in coalition operations unless months exist to hone the related command-and-control systems.[24]

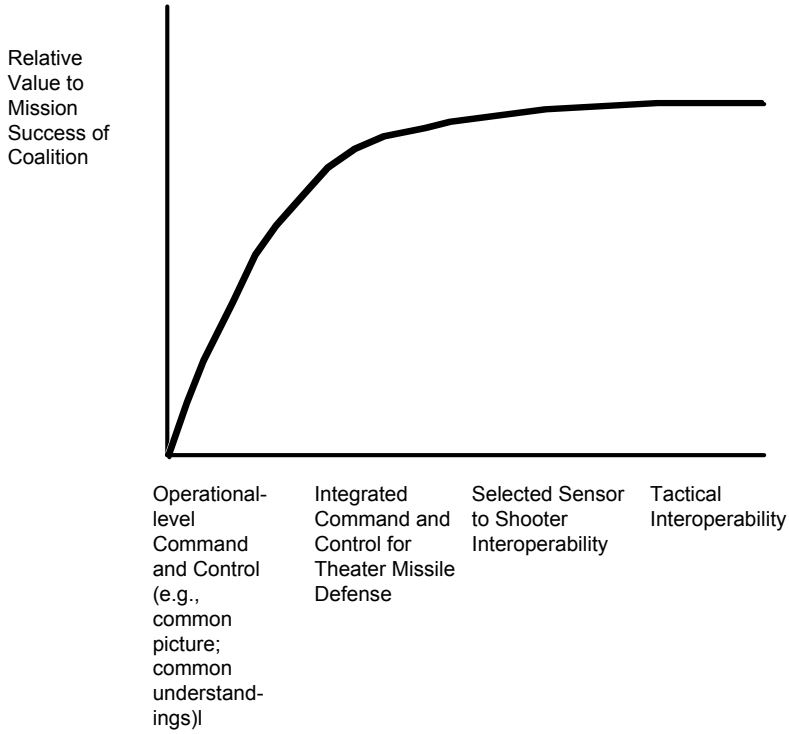
The second item reflects the fact that missile defense is fundamentally different: the time scales are short, and defense effectiveness will likely depend critically on coordinated layering. The mathematics here are compelling. If one has three defense systems, each with a 70 percent probability of intercepting a given missile, then the combined effectiveness can be 97 percent—but only if the systems are independent and all operate against that missile. In contrast, if a missile going through one portion of the theater can be attacked by only one of the systems (that is, the sky has been divvied out among systems), then effectiveness will be only 70 percent. If missiles have chemical, biological, or nuclear warheads, then such an effectiveness is likely to be unacceptable. Similarly, if there are three defense systems with limited capacities against multiple targets and decoys, any one of the systems could have zero-effectiveness for later missiles in a salvo attack on a critical target. However, if properly networked, the overall system might be a good deal more effective. It follows that very high standards of network-centric efficiency will be needed.

To summarize, differences in U.S. and allied systems and capabilities are indeed a matter of concern. However, some are much more important ultimately than others (figure 3). It is to be hoped that priorities develop accordingly.

The Multiplicity of Instruments

Most of this paper has dealt with military transformation, but in a volume devoted to globalization, it seems appropriate to emphasize that future success in international security work requires much more. Military instruments are uniquely powerful for some purposes, but it is the overall system of power and related instruments that matter. Indeed, as figure 4 suggests, the power of good international relationships is greater than the power of general deterrence, which is substantially greater than the power of immediate deterrence (crisis action), which is in turn substantially greater than various compellent actions associated with actual force employment. The primary task in international security is not so much to win the Nation's wars and lesser scuffles, but to make such events unnecessary.

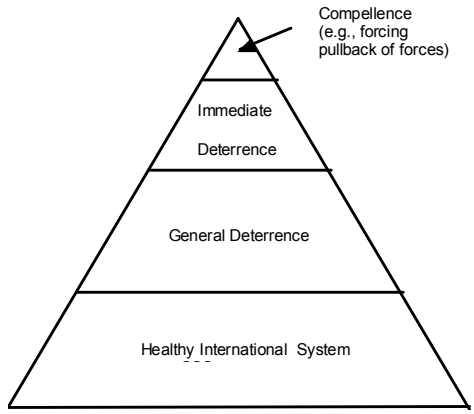
Figure 3: Not All Interoperability Is Equally Important
Transforming Political-Economic-Military Doctrine



Deterrence and Compellence Often Require Coalition Unity

The folly of depending too much on the upper levels of the pyramid in figure 4 becomes evident when we look at the historical record and acknowledge that the history of multinational interventions is not a happy one. Consider, for example, the bluntness and ineffectiveness of the North Atlantic Treaty Organization (NATO) strategy in dealing with the Kosovo crisis and its antecedents. Although NATO prevailed eventually, it failed to head off the crisis in the first place, to prevent ethnic cleansing, or to substantially reduce the capabilities of the Serbian Army. This was so despite overwhelming NATO military superiority. The Kosovo affair is still recent, but we might think also of the debacle in Somalia, the dubiousness of results overall in Bosnia, or the results of many other UN interventions. There simply is no basis for optimism as we look to the future unless something changes.

Figure 4. Relative Effectiveness of Security Factors
Effectiveness decreases with area of layer in figure



The first principle is to address problems at a more fundamental level and head off the crises in the first place. Arguably, three other principles should also be followed:

- The United States and its likely coalition partners need to develop consensus views ahead of time on how to deal—using the full range of instruments—with potential regional crises.
- This consensus should be forged around the requirement for effectiveness rather than ad hoc political expediency. This will imply much more emphasis on prior expressions of firm intent, in response to aggression, to apply strong, long-term political and economic sanctions; and prior expressions of firm intent, in response to aggression, to use military means in limited but decisive ways—even at the cost of some innocent lives and some casualties to service personnel.
- These intentions should be made known in ways that undergird deterrence and increase credibility in situations of immediate deterrence or attempted compellence.

Adopting and executing these principles would be very difficult: in many respects they fly in the face of natural political-level thinking. However, at some point, the world's nations must recognize that unusual measures such as these are needed if crises are to be averted or dealt with effectively when they arise. Deterrence and compellence are very difficult and are undercut by the natural phenomena of ambiguity, indecision, and divisiveness among allies.[25]

Illustrative Implications

If accepted, the principles just described would have many implications. For example, although many nations would prefer a strong U.S. military presence over the horizon (but not in their immediate neighborhood), the quality of general deterrence and immediate deterrence is sometimes far higher with more immediate presence.

This is due not only to the increased and visible military capability that may be achieved, but also to the fact that having forces already in place simplifies and toughens decisionmaking for the United States and the allies that it would defend. Presence implies commitments, whereas failures of deterrence often occur because of a perceived lack of commitment or resolve.

As a second example, consider implications for force employment planning. As a preface, we might compare the experiences of *Desert Storm* with those of Kosovo. In *Desert Storm*, the fighting war was measured in tens of hours rather than months—in large part because of the comprehensive, focused, and creative manner in which the offensive was conducted (and the enormous effects of the preceding air attack). The contrast with the Kosovo operation is stark. Immediate objectives were not achieved, and many innocent people died as a result of ethnic cleansing begun in earnest after NATO began its operations. NATO forced Milosevic to back down eventually, but at an extraordinary cost. Dealing with a fourth-rate nation required a substantial fraction of U.S. and allied air forces and months of time. The price of self-imposed NATO constraints was high.

What lessons should be learned, and to what extent will future political-economic-military doctrine be different? Will leaders again talk themselves into believing that modest strikes virtually designed to avoid harm will accomplish compellent goals or that the threat thereof will deter aggression in the first place? Will they be so convinced on the matter as not even to develop full-scale contingent options to execute if needed?

We cannot rerun history, but it is legitimate to argue that the likelihood of an early success that would have prevented ethnic cleansing might have been much higher had the alliance visibly prepared for the immediate use of ground forces and the potential for a subsequent full-scale invasion of Serbia, and struck air and missile targets initially with far greater intensity and fewer constraints (albeit at the price of some casualties to NATO pilots and many more civilian casualties in Kosovo and Serbia). The lessons learned would seem to support the principles suggested above.

The purpose here is not to second-guess the decisions of anguished NATO political leaders but to emphasize that there are lessons to learn and that those lessons tend to call for increased decisiveness and, in some cases, casualty tolerance and use of ground forces. That, in turn, calls for extensive efforts in peacetime to bring about the changes in attitude within alliances that would make such decisiveness possible in sufficiently serious crises. Regrettably, many officials emerged from the Kosovo experience believing that it was ultimately a success, which is not the case.

As a third example of how the principles might apply, consider the dismal history of attempting to use political and economic threats for deterrence and after-the-fact compellence. The sanctions have often had many profound effects, but most typically the innocent have suffered and objectives have not been achieved. Among the reasons are that, in a crisis, a miscreant leader who is the object of deterrence or compellence may believe that sanctions may not actually be applied, since the relevant nations disagree about them; that even if they are applied, they will be leaky, spotty, and temporary; and, finally, that so long as he remains in power, he will be able to allocate whatever resources remain after sanctions to his own purposes.

A Modest Proposal

To conclude, I note that one of the most traditional American images has been that of the hero who is reluctant to accept a fight, but who acts suddenly and decisively when the threshold is crossed. A version of the image was Theodore Roosevelt's adage, "Speak softly, but carry a big stick." Sometimes folk wisdom has merit. The United States and its many allies worldwide need to develop a comparable doctrine, and they need the underlying consensus and the physical and doctrinal capacity to carry it out. Without this, the value of military transformation will be much reduced.

Notes

[1] William S. Cohen, *Report of the Quadrennial Defense Review* (Washington, DC: Government Printing Office, 1997). See also National Defense Panel, *Transforming Defense: National Security in the 21st Century* (Washington, DC: Government Printing Office, 1997).

[2] Paul K. Davis, David C. Gompert, Richard Hillestad, and Stuart E. Johnson, *Transforming the Force: Suggestions for DOD Strategy*, RAND Issue Paper (Santa Monica, CA: RAND, 1998).

[3] Such problems were highlighted in a 1995 Defense Science Board study led by John Foster. See also Cohen, *Report of the Quadrennial Defense Review* and National Defense Panel, *Transforming Defense*.

[4] This is used by Andrew W. Marshall, the Pentagon Director of Net Assessment. See Jeffrey Barnett, *Future Warfare: Assessment of Future Aerospace Campaigns 2010* (Maxwell AFB, AL: Air War College, 1996) for a good survey on the subject that reflects much work done by Marshall's office. Other mid-to-late 1990s discussions of the revolution in military affairs can be found in Cohen, *Report of the Quadrennial Defense Review*, Joint Chiefs of Staff, *Joint Vision 2010* (Washington, DC: Department of Defense, 1997), Joint Chiefs of Staff, *Joint Vision 2020* (Washington, DC: Department of Defense, 2000), Andrew Krepenevich, "Cavalry to Computer: The Pattern of Military Revolutions," *The National Interest* (Fall 1995), Stuart E. Johnson and Martin C. Libicki, eds., *Dominant Battlefield Knowledge: The Winning Edge* (Washington, DC: National Defense University Press, 1995), James A. Blaker, *A Vanguard Force: Accelerating the American Revolution in Military Affairs* (Washington, DC: Progressive Policy Institute, 1996), and Institute for National Strategic Studies, *Strategic Assessment 1996* (Washington, DC: National Defense University Press, 1996).

[5] See Stephen Peter Rosen, *Winning the Next War: Innovations and the Modern Military* (Ithaca, NY: Cornell University Press, 1991), Krepenevich, "Cavalry to Computer," Jeff Isaacson, Christopher Layne, and John Arquilla, *Predicting Military Innovation*, RAND DB–242–A (Santa Monica, CA: RAND, 1998), and Richard Hundley, *Past Revolutions, Future Transformations: What Can the History of Revolutions in Military Affairs Tell Us about Transforming the U.S. Military* (Santa Monica, CA: RAND, 1999), for interesting discussions.

[6] For discussions of urban issues, see Russell W. Glenn, ed., *The City's Many Faces*, CF–148–A (Santa Monica, CA: RAND, 2000) and Alan Vick, John Stillion, David Frelinger, Joel Kavitky, Benjamin Lambeth, Jefferson Marquis, and Mathew Waxman, *Aerospace Operations in Urban Environments: Exploring New Concepts* (Santa Monica, CA: RAND, 2000).

[7] Examples include the Office of Net Assessment, the Defense Science Board, services science advisory boards, and think tanks.

[8] See David C. Gompert and Irving Lachow, *Transforming the Force: Lessons from the Wider Revolution*, RAND Issue Paper (Santa Monica, CA: RAND, 2000), for lessons to be learned from industry's information revolution.

[9] Leadership for DOD effort has come from Assistant Secretary of Defense Edward Warner and his office and from two Chairmen, General John M. Shalikashvili and General Hugh H. Shelton, and their staffs.

[10] The value of such mission orientation and system thinking is emphasized in Davis, et al., *Transforming the Force*, Paul K. Davis, James H. Bigelow, and Jimmie McEver, *Analytical Methods for Studies and Experiments on "Transforming the Force,"* DB–278–OSD (Santa Monica, CA: RAND, 1999), Gompert and Lachow, *Transforming the Force*, and the National Research Council, *Network Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities*, Naval Studies Board (Washington, DC: National Academy Press, 2000).

[11] This section has benefited from discussions with colleague Richard Hundley.

[12] Hundley, *Past Revolutions, Future Transformations*.

[13] Paul K. Davis, *New Challenges in Defense Planning: Rethinking How Much Is Enough*, chapter 2 (Santa Monica, CA: RAND Compendium, 1994).

[14] Some enthusiasts for change apparently believed that the panacea was large joint field experiments, whereas what is needed is a multifaceted, iterative effort involving a combination of brainstorming, laboratory research, modeling, simulation, and gaming, as well as field experiments (Davis, Bigelow, and McEver, *Analytical Methods for Studies*). U.S. Joint Forces Command now embraces this view.

[15] William F. Kernan, who currently heads the Army's prestigious XVIII Corps, succeeded Gehman in early autumn 2000.

[16] See Defense Science Board, *Tactics and Technology for 21st Century Operational Superiority, Office of the Under Secretary of Defense for Acquisition and Technology* (Washington, DC: Department of Defense, 1996), Defense Science Board, *Joint Operations Superiority in the 21st Century: Integrating Capabilities, Underwriting Joint Vision 2010 and Beyond*, 2 vols. (Washington, DC: Office of the Under Secretary of Defense for Acquisition and Technology, 1998), and Harlan K. Ullman and James P. Wade, *Shock and Awe: Achieving Rapid Dominance* (Washington, DC: Government Printing Office, 1996). A related concept that is now under study by direction of the Office of the Secretary of Defense is that of a Joint Strike Force (JSF). The Institute for Defense Analyses is currently doing an OSD–sponsored JSF study, working with JFCOM's staff engaged in the Rapid Decisive Operations effort.

[17] Joint Chiefs of Staff, *Joint Vision 2010*.

[18] Defense Science Board, *Tactics and Technology and Defense Science Board, Joint Operations Superiority in the 21st Century*.

[19] The services' initiatives are described briefly in vision documents that can be found at their Web sites, all of which can be reached from <http://www.defenselink.mil>. See also the brief accounts in the annual defense report; for example, William S. Cohen, *Annual Report to the President and Congress* (Washington, DC: Department of Defense, 2000).

[20] As one example, developing the operational capability to halt an invading army *early* depends on a whole system of subordinate but integrated capabilities. Missions can fail even with superb weapons because of a number of weak points in the system. Perhaps most obvious is command and control. There is little precedent for complex command and control, as would be required for early-halt operations, to work immediately and from a standing start. For discussion of such matters and the system perspective, see Davis, Bigelow, and McEver, *Analytical Methods for Studies*.

[21] National Research Council, *Network Centric Naval Forces*; David Alberts, John J. Garstka, and Frederick Stein, *Network Centric Warfare* (Washington, DC: National Defense University Press, 1999).

[22] Some of these arrangements will involve access to bases (for example, for servicing of ships, even "homeporting"), pre-positioning, and prior discussions about potential needs during crisis operations.

[23] See Reiner Huber and Bernhard Schmidt, *The Challenge for Defense Reform in Europe* (McLean, VA: Potomac Foundation, 2000), for a discussion of European force needs and priorities.

[24] See Michele Zanini and Jennifer Taw, *Multiforce Compatability: Lessons from Past Operations* (Santa Monica, CA: RAND, 1998).

[25] See National Research Council, *Post Cold War Conflict Deterrence* (Washington, DC: National Academy Press, 1996), Appendix J, for my own views on deterrence, which reflect an analysis of past crises and counterfactual versions using psychologically realistic models of decisionmakers, such as Saddam Hussein.